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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,493	09/02/2003	Yun Soo Choe	1670.1015	2730

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EXAMINER

PAIK, SANG YEOP

ART UNIT PAPER NUMBER

3742

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

TKM

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/652,493	CHOE ET AL	
	<b>Examiner</b>	<b>Art Unit</b>	
	Sang Y. Paik	3742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 7-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 September 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings filed on 9/7/05 are objected to because proper hatchings are not shown in the cross sectional views to indicate the various materials used. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 4, 7, 9, 11-13, 16-18 and 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow (US 5,157,240) in view of Chandler (US 2,799,764) or Isaacson et al (US 3,842,241).

Chow shows a heating crucible having a main body container, a cover formed of an insulating material such as the nitride ceramic with a nozzle, a cover heater formed as a thin film on a top surface of the cover, a body heater for heating the main body, the cover heater having a single wire pattern with the positive and negative thermals, a thermocouple in the cover, a heat-resistant layer (25') on the cover heater, the main body also formed of an insulating material such as the nitride ceramic with a body heater as a thin film on the outer wall of the main body, a heat resistant layer (25) on the body heater, the body heater having a single wire pattern with the positive and negative terminals, the body heater is also formed on the bottom portion of the main body, and a thermocouple inside the main body. However, Chow does not show a heat reflective layer between the heater and the heat-resistant layer.

Chandler or Isaacson shows that it is well known in the art to provide a heating device having a heating element provided with a heat reflective layer to direct the heat toward the desired heating surface. In Chandler, it is shown that the heating element (72) is provided on a heating surface (76) with a heat reflecting layer (62) disposed between the heating element and a heat resistant/insulating layer (78). Isaacson also shows a heating surface (14) upon which a heating element (50) provided thereto with a heat reflective layer (56) disposed between the heating element and a heat resistant layer (40).

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In view of Chandler or Isaacson, it would have been obvious to one of ordinary skill in the art to adapt Chow with a reflective layer provided between the heat resistant layer and the heater to reflect the heat generated by the heater toward an intended heating direction.

With respect to claim 9, Chow shows the cover having a nozzle in the center of the cover with a cover heater provided around the nozzle. However, while, Chow does not show that the cover heater concentric pattern around the nozzle, it would have been obvious to one of ordinary skill in the art to provide the cover heater in the concentric pattern or any other pattern to affectively provide uniform and stable heating across the cover.

4. Claims 3, 14 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18 and 20-25 above, and further in view of Kano et al (US 6,242,719).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except the cover heater being platinum.

Kano shows a heating element such as platinum or graphite deposited on an insulating ceramic layer such as pyrolytic boron nitride or aluminum nitride. In view of Kano, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the cover heater made of platinum as an alternative conductive material that can alternatively provide stable and uniform heating temperature, and with respect to claim 14, it would have been obvious to further provide insulating material made of aluminum nitride that alternatively provide a good electrical and thermally conductive material.

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5. Claims 8, 15 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18 and 20-25 above, and further in view Bichrt (US 6,162,300).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except the cover or the main body is made of alumina or silicon carbide

Bichrt shows a ceramic body made of alumina or silicon carbide as well as pyrolytic boron nitride. In view of Bichrt, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the cover and the main body made of alumina or silicon carbide in place of the pyrolytic boron nitride since such is well known in the art to alternatively provide a mechanically and thermally stable body that can withstand a temperature, pressure and chemical stress.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chow in view of Chandler or Isaacson as applied to claims 1, 2, 4, 7, 9, 11-13, 16-18 and 20-25 above, and further in view Okuda et al (US 4,804,823).

Chow in view of Chandler or Isaacson shows the heating crucible claimed except the cover heater is made of conductive paste with metal particles and metal oxides.

Okuda show that it is known in the art to provide a conductive paste made with metal particles or metal oxides applied to a ceramic substrate to form an electrical heater. In view of Okuda, it would have been obvious to one of ordinary skill in the art to adapt Chow, as modified by Chandler or Isaacson, with the cover heater made of conductive paste having the metal particles and metal oxides to form a heating element that can provide a mechanically and thermally stable heater that can also withstand a high temperature.

***Response to Arguments***

7. Applicant's arguments filed 10/31/05 have been fully considered but they are not persuasive.

With respect to the Examiner's objection to the drawings, the applicants deem that it is not "required" to use the hatching symbols to indicate the type of materials. It would be applicants' own discretions to follow the suggested symbols, but it is noted that if the objection to the drawings is not overcome, it may result in abandonment of the application. Also see 37 CFR 1.84 and 1.85.

The applicant argues that the protective layers 25' and 25" made of pyrolytic boron nitride having 1.0 to a few mils thick would not be capable of acting as a heat-resistant layer. In the applicants' disclosure on page 7, paragraph (0035), it is disclosed that the heat-resistant layer 46 is formed as a thin film type. Since the applicant discloses the heat-resistant layer to be a thin layer, the layer 25' or 25" of Chow being a thin layer of 1.0 to a few mils would be capable of acting as the heat-resistant layer. Likewise the layer 25 formed on the body heater would also be capable of acting as a heat-resistant layer.

The applicant also argues that it would not have been obvious to combine Chow with Chandler or Isaacson to modify Chow with the reflective layer because Chow does not suffer from any problems that would be solved with teachings of Chandler or Isaacson. While Chow may function properly without having a reflective layer, the teachings of Chandler or Isaacson would have motivated one of ordinary skill in the art to adapt Chow with a reflective layer to better direct the heat radiation toward the desired direction. In both Chandler and Isaacson, a reflective layer is provided between a heater and a heat resistant layer to better able to direct the

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heat radiation toward a desired direction, and in both Chandler and Isaacson, the heating device would have functioned without the reflective layer as well. For Chow, it would have been obvious to one of ordinary skill in the art to adapt a reflective layer as done in Chandler and Isaacson to better direct the heat radiation toward a desired direction, i.e., toward the main body to more effectively heat the contained substance. Thus, the examiner believes that the prima case for obviousness was established.

With respect to claims 2 and 18, the applicants argue Chow has the cover heaters in two patterns rather than a single wire pattern as claimed by the applicants. Single wire pattern is covered or met by the two wire heating patterns of Chow. Likewise, the claimed body heater of a single wire pattern is covered within the two body wire patterns of Chow.

With respect to claims 7 and 25, the applicants argue that the examiner has not discussed the recited insulating material having a good heat radiation. Chow shows the cover made of an insulating material as claimed in claim 1. Since both are made of the same “insulating” material, the recited properties are presumed inherent.

With respect to claim 9, the applicant argues the cover heater formed of the concentric pattern around the nozzle is not shown by the applied art and no motivation is identified. Chow teaches that having a uniform heating distribution of the heating elements is important to avoid hot and cold zones. Chow shows a heating wire that encircles a hole or nozzle but does not explicitly shows the concentric pattern, but just as the applicant allows other forms of heating pattern to be used to form the heating pattern (see paragraph 31), it would have been obvious to one of ordinary skill to provide a concentric circle as well as other forms of heating pattern to achieve a uniform heating across the cover.



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With respect to claim 16, the applicant argues the cover heater is formed by spray coating. It is noted that the patentability of an apparatus is determined by the product itself and not by the which it is made. Also see MPEP 2113. Likewise, the applicants' argument with respect to claim 3 and 19 regarding the process is not deemed persuasive.

With respect to claim 20, the applicant argues Chow does not show the body heater formed over the bottom of the main body. It is shown in Figure 2, a body heater that is formed throughout the main body including the top and middle and bottom of the main body.

With respect to claim 10, the rejection made under Maeda is withdrawn but the recited elements are met under Okuda which clearly shows yttria or magnesia or alumina which are known as metal oxides.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y. Paik whose telephone number is 571-272-4783. The examiner can normally be reached on M-F (9:00-4:00) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sang Y Paik  
Primary Examiner  
Art Unit 3742

syp